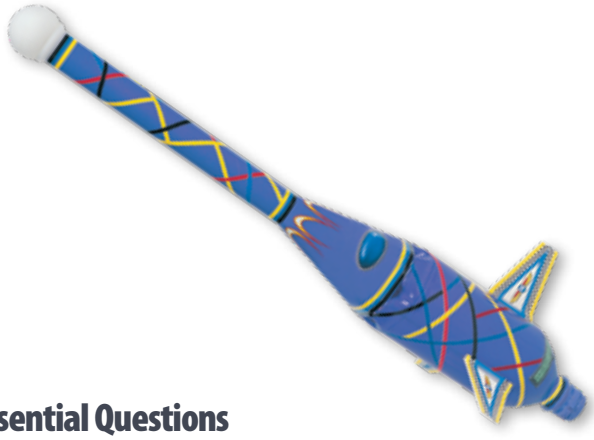
# Water Rocket

Grades 6+ | Students Served: 30

MIDDLE LEVEL HIGH SCHOOL



## Essential Questions

How do fin shape and size affect the altitude of the water rocket?

How do water and air make a rocket fly?

How do Newton's first, second, and third laws apply to rockets?

## Career Connections:

- Research Engineer
- Aerospace Engineer
- Rocket Scientist
- Electrical Engineer

⚠ Cancer and reproductive harm – www.P65Warnings.ca.gov

## STEM Connections

### Science

- Thrust
- Newton's laws
- Center of gravity/pressure

### Engineering

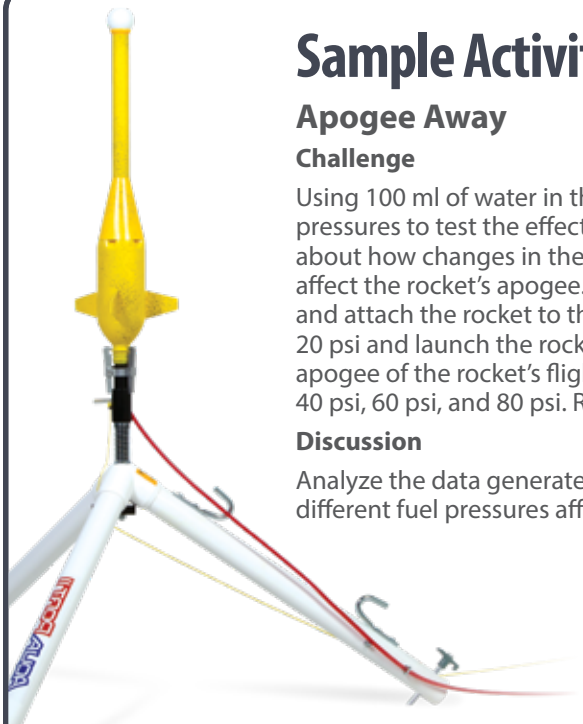
- Prediction
- Technological design
- Modeling

### Technology

- Problem solving
- Design processes
- Construction processes

### Math

- Trigonometry
- Truncated cones
- Axial symmetry



## Sample Activity

### Apogee Away

#### Challenge

Using 100 ml of water in the rocket, experiment with different air pressures to test the effect on the rocket's apogee. Hypothesize about how changes in the air pressure in the rocket's fuel will affect the rocket's apogee. Then, place the water in the rocket and attach the rocket to the launcher. Pump up the launcher to 20 psi and launch the rocket. Using an altitude finder, find the apogee of the rocket's flight and record it. Repeat the launch at 40 psi, 60 psi, and 80 psi. Record the results.

#### Discussion

Analyze the data generated from your tests and explain how different fuel pressures affect a rocket's apogee.